UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 60019

MSAS NO. 119

OVER THE

RED LAKE RIVER

DISTRICT 2 - POLK COUNTY, CITY OF EAST GRAND FORKS

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 39)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 60019, Piers 6 and 7, were found to be in good condition with no defects of structural significance observed. Since the previous inspection, the footing exposure at the center and upstream columns of Pier 7 has increased in length and height with up to 4 feet of vertical exposure. A large accumulation of timber debris was observed at the upstream nose of Pier 7. The channel bottom around the substructure units consisted of clay, which appeared stable with no significant scour at the time of the inspection. Since the last inspection, undermining with up to 1.5 feet of maximum penetration has developed at Pier 7.

INSPECTION FINDINGS:

(A) The concrete surfaces of both piers were found to be smooth and sound with no significant structural defects observed.

(B) The top of the footing of the upstream column at Pier 7 was exposed around the entire column at 3.1 feet below the waterline with a maximum vertical face exposure of 4 feet. The footing was undermined at the southwest corner, 3 feet along the south face, 1 foot along the west face, with 6 inches of vertical height and 1.5 feet of maximum penetration.

(C) The top of the footing of the center column of Pier 7 was exposed for a length of 8 feet along the south face with up to 3.5 feet of vertical face exposure.

(D) A moderate accumulation of timber debris, consisting of 6 inch to 1 foot diameter logs and branches, was observed at the upstream end of Pier 7 and extended from the channel bottom to 2 feet above the waterline. The timber debris extended from the upstream end of Pier 7 to the north shoreline and along the shore to the center column of the pier. There was also light timber drift at Pier 6 and around the remainder of Pier 7.

(E) A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed at the upstream sides of the downstream column of Pier 6 extending from the channel bottom to the waterline, radiating southward.

RECOMMENDATIONS:

(A) Monitor the accumulations of timber debris around Pier 7 and the undermining present at the pier during future underwater inspections.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 60019

Feature Crossed: Red Lake River

Feature Carried: MSAS No. 119

Location: District 2 - Polk County, City of East Grand Forks

Bridge Description: The bridge superstructure consists of twelve spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments, four reinforced concrete piers, and seven steel bent piers. All of the concrete substructure footings are supported by steel H-piles. The piers are numbered starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 19, 2007

Weather Conditions: Cloudy, 65ºF

Underwater Visibility: 0.5 feet

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 6 and 7

General Shape: The piers each consist of three cylindrical reinforced concrete columns supporting a rectangular reinforced concrete pier cap. The upper portions of the columns are connected by slender reinforced concrete diaphragms and each column is supported by a square footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 7.1 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 7.

Water Surface: The waterline was approximately 32.3 feet below reference. Waterline Elevation = 798.8.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code F/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

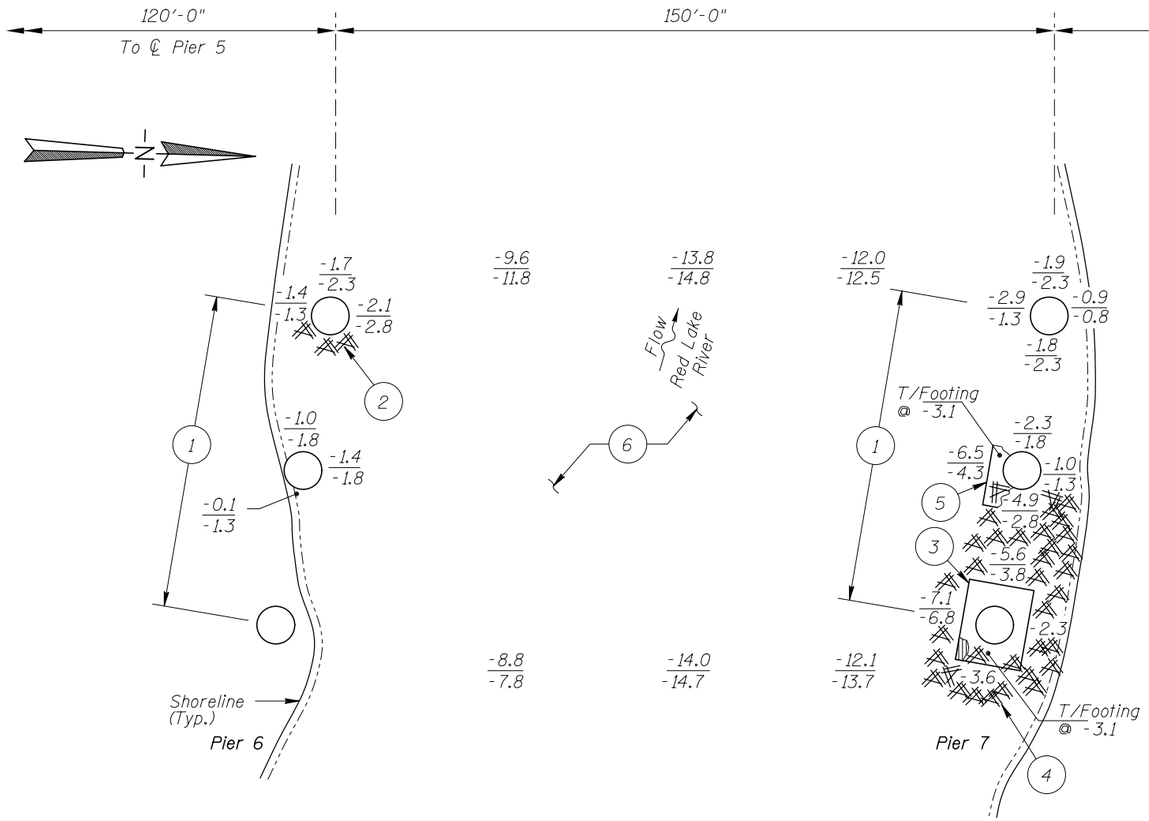
_____ Yes X No

Photograph 1. View of the Structure, Looking Southeast.

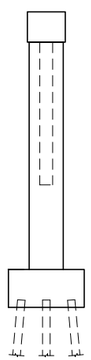
Photograph 2. Overall View of Pier 6, Looking Southwest.

Photograph 3. Overall View of Pier 7, Looking Northeast.

Photograph 4. View of North approach spans, Looking Northwest.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 6 and 7 were inspected underwater.
2. At the time of inspection on August 19, 2007, the waterline was located approximately 32.3 feet below the top of the pier cap at the downstream end of Pier 7. This corresponds to a waterline elevation of 798.8.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) Overall, the concrete of the piers was found to be smooth and sound with no significant deterioration.

(2) A light accumulation of timber debris, consisting of 8 to 10 inch diameter branches, was observed at the upstream sides of downstream column of Pier 6 from the channel bottom to the waterline and radiating southward.

(3) The top of the footing of the upstream column of Pier 7 was exposed around the entire column at 3.1 below the waterline feet with a maximum vertical face exposure of 4 feet (full height). The footing was undermined at the southwest corner, 3 feet along the south face, 1 foot along the west face, with 6 inches of height and 1.5 feet of maximum penetration.

(4) A moderate accumulation of timber debris, consisting of 6 inches to 1 foot diameter logs and branches, was observed around the upstream end of Pier 7 and extended from the channel bottom to approximately 2 feet above the waterline. The timber debris was located from the pier to the north shore and from the upstream column to the center column of Pier 7. There was also some light drift around the remainder of the pier.

(5) The top of footing of the center column of Pier 7 was exposed along the south face for 8 feet and east face for 2 feet with up to 3.5 feet of vertical exposure.

(6) The channel bottom consisted of clay with up to 1 foot of probe rod penetration around both piers.

Legend

-2.0 / -5.2 — Sounding Depth (8/19/07) / Sounding Depth (10/28/07)

Timber Debris

Indicates Area of Undermining

Note:

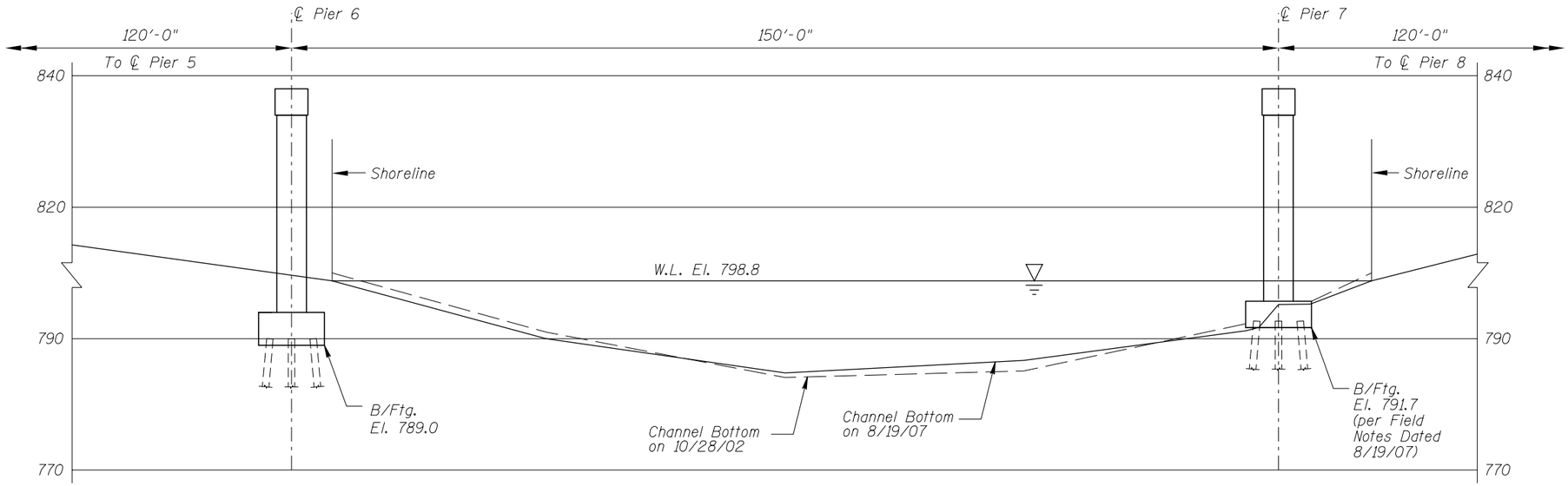
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

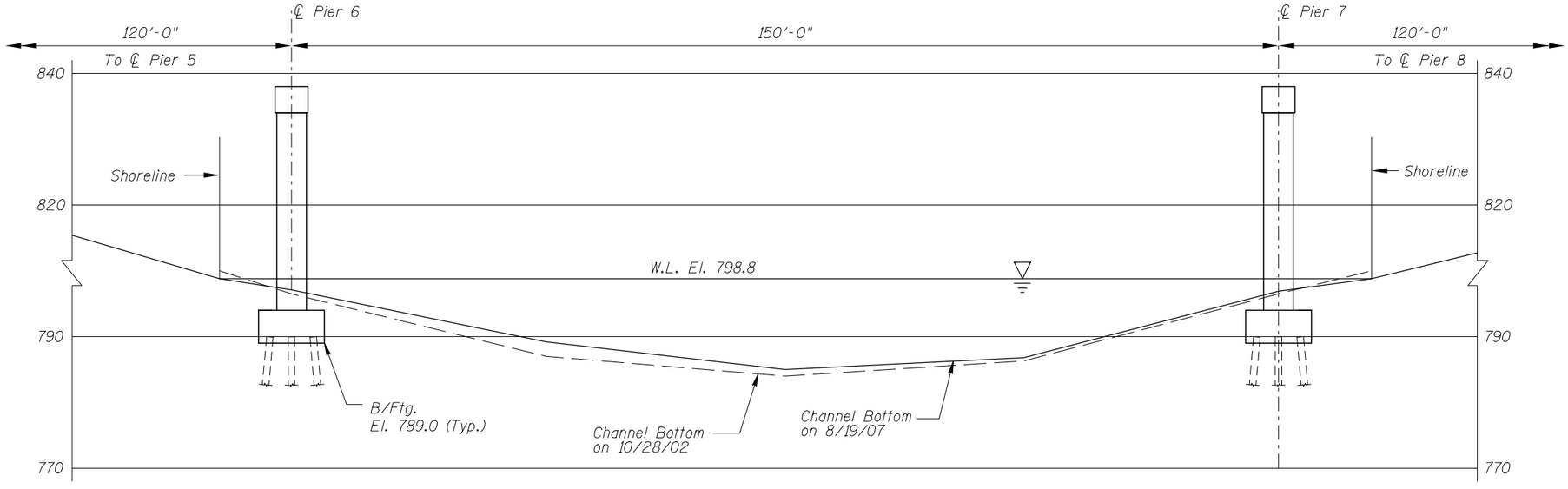
STRUCTURE NO. 60019
OVER THE RED LAKE RIVER
DISTRICT 2, POLK COUNTY, CITY OF EAST GRAND FORKS

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210039		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=20'
Code: 52210039		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 19, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 60019 WEATHER: Cloudy, 65ºF

WATERWAY CROSSED: Red Lake River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER_____

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera

TIME IN WATER: 12:00 P.M.

TIME OUT OF WATER: 1:20 P.M.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY 0.5 feet

DEPTH 7.1 feet maximum at Pier 7

ELEMENTS INSPECTED: Piers 6 and 7

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. The footing of Pier 7 was exposed at the center and upstream columns with a maximum vertical face exposure of 4 feet (full height) at the upstream column at the time of the inspection. The upstream column footing was undermined at the southwest corner with a maximum height of 6 inches and a maximum penetration of 1.5 feet. A large accumulation of timber debris consisting of up to 1 foot diameter drift was observed at the upstream and center columns of Pier 7. There was also light drift at Pier 6 and around the remainder of Pier 7. The channel bottom consisted of firm material, which appeared stable with no significant scour at the time of the inspection.

FURTHER ACTION NEEDED: _____ YES ___X____ NO

Monitor the accumulation of timber debris around Pier 7 and the undermining present at the pier during future underwater inspections.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 60019
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Red Lake River

INSPECTION DATE August 19, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 6	2.1’	N	8	N	9	N	8	7	7	7	7	7	8	N	N	N	N	N
	Pier 7	7.1’	N	8	7	9	N	7	5	7	7	6	5	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete was in good condition with no defects of structural significance observed. The footing of Pier 7 was exposed at the center and upstream columns with a maximum vertical face exposure of 4 feet (full height) at the upstream column at the time of the inspection. The upstream column footing was undermined at the southwest corner with a maximum height of 6 inches and a maximum penetration of 1.5 foot. A large accumulation of timber debris consisting of up to 1 foot diameter drift was observed at the upstream and center columns of Pier 7. There was also light drift at Pier 6 and around the remainder of Pier 7. The channel bottom consisted of firm material, which appeared stable with no significant scour at the time of the inspection.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.